

Listing of Claims

What is claimed is:

Claims 1-47 (Canceled)

48. (Currently Amended) A data transport interface between a digital signal processing host device and an external service module, comprising:

a transceiving unit, configured to receive from and transmit to the digital signal processing host device data which accords with a USB (Universal Serial Bus) specification;

a detecting unit, configured to detect USB packets ~~the data~~ received by the transceiving unit, so as to determine whether the received USB packets carries to convert the received data into data which accords with a particular specification and is available for the external service module;

an interface protocol identification unit, configured to identify an interface protocol of the external service module; and

a conversion unit, configured to convert the received USB packets to obtain data into the data which accords with the particular specification when determining that the received USB packets carries data should be converted into the data which accords with the particular specification, and configured to convert [[the]] transmission data from the external service module which accords with the particular specification into data which accords with the USB specification for transmission via the transceiving unit based on the identified protocol of the external service module.

49. (Previously Presented) The interface of claim 48, wherein the conversion unit comprises: an unpackaging unit, configured to unpackage the received data into the data which accords with the particular specification.

50. (Previously Presented) The interface of claim 48, wherein the conversion unit comprises:

a packaging unit, configured to package the transmission data into the data which accords with the USB specification.

51. (Previously Presented) The interface of claim 49, wherein the conversion unit comprises:

a packaging unit, configured to package the transmission data into the data that accord with the USB specification.

52. (Previously Presented) The interface of claim 51, wherein the particular specification is a MPEG specification.

53. (Previously Presented) The interface of claim 52, wherein the conversion unit further comprises:

a P/S conversion unit, configured to convert parallel synchronous transmission data which accords with the MPEG specification into serial asynchronous data which accords with the USB specification;

wherein the data which accords with the USB specification includes an integer multiple of packets which accord with the MPEG specification.

54. (Previously Presented) The interface of claim 53, wherein the conversion unit further comprises:

a S/P conversion unit, configured to convert the received serial asynchronous data which accords with the USB specification into parallel synchronous data which accords with the MPEG specification.

55. (Previously Presented) The interface of claim 54, wherein any one of the data which accords with the USB specification and the data which accords with the MPEG specification comprises at least one of service data and control information, the control information being used to control operations of a device equipped with the interface.

56. (Previously Presented) The interface of claim 55, wherein the service data comprises at least one of audio data and video data.

57. (Currently Amended) The interface of claim 55, wherein the control information ~~comprises~~ comprises at least one of information for implementing PnP (Plug and Play) function, information on resource allocation and information on the transmission rate to be used.

58. (Previously Presented) The interface of claim 57, wherein the control information may be transmitted in a data transfer mode of at least one of bulk data transfer and interrupt data transfer in the USB specification.

59. (Currently Amended) A digital signal processing apparatus, comprising:
an interface, which includes:
a transceiving unit, configured to receive and transmit data that accords with USB (Universal Serial Bus) specification;
a detecting unit, configured to detect the USB packets the ~~[[data]]~~ received by the transceiving unit, so as to determine whether the received USB packets carries ~~to convert the received data into~~ data which accords with a particular specification and is available for the digital signal processing apparatus;
an interface protocol identification unit, configured to identify an interface protocol of an external service module; and
a conversion unit, configured to convert the received USB packets to obtain data into the data which accords with the particular specification when determining that the received USB packets carries ~~data should be converted into~~ the data which accords with the particular specification, and to convert the transmission data which accords with the particular specification into data which accords with the USB specification for transmission to the external service module via the transceiving unit, based on the identified interface protocol of the external service module;
wherein the particular specification is a MPEG specification;
a processing unit, configured to perform at least one of playing, decrypting and storing the signals received via the interface.

60. (Previously Presented) The digital signal processing apparatus of claim 59, further comprising:
a RF (Radio Frequency) processing unit, configured to demodulate the RF signals received by the digital signal processing apparatus, to transmit the demodulated signals via the interface.

61. (Previously Presented) The digital signal processing apparatus of claim 60, wherein the processing unit comprises:
an audio decoding unit, configured to decode audio signals received via the interface;
a video decoding unit, configured to decode video signals received via the interface;
a playback unit, configured to play the decoded audio/video signals.

62. (Previously Presented) The digital signal processing apparatus of claim 61, further comprising:

a control unit, configured to extract a control command from the signals received via the interface;

wherein the playback unit plays the decoded audio/video signals according to the control command.

63. (Previously Presented) The digital signal processing apparatus of claim 62, wherein the RF (Radio Frequency) processing unit is further configured to transmit the control command.

64. (Withdrawn) The digital signal processing apparatus of claim 63, wherein the control command further comprises EPG (Electronic Program Guide) information.

65. (Withdrawn) The digital signal processing apparatus of claim 64, further comprising:

a graphics display unit, configured to display the EPG information according to the control command.

66. (Withdrawn) The digital signal processing apparatus of claim 61, further comprising:

a software update unit, configured to store the software data received via the interface and to update the software.

67. (Withdrawn) The digital signal processing apparatus of claim 61, further comprising:

a channel and tuner control information generation unit, configured to generate channel and tuner control information to choose a corresponding RF channel according to user requirement;

the channel and tuner control information is transmitted via the interface.

68. (Currently Amended) The digital signal processing apparatus of claim 59, further comprising:

- an audio decoding unit, configured to decode the audio signals received via the interface, and to provide the decoded audio signals to ~~[[the]]~~ a playback unit for playing;

- a video decoding unit, configured to decode the video signals received via the interface, and to provide the decoded video signals to the playback unit for playing.

- ~~[[a]]~~ the playback unit, configured to play the decoded audio/video signals received via the interface.

69. (Previously Presented) The digital signal processing apparatus of claim 68, further comprising:

- a control unit, configured to extract a control command from the signals received via the interface;

- wherein the playback unit plays the decoded audio/video signals according to the control command.

70. (Previously Presented) The digital signal processing apparatus of claim 69, wherein the control command further comprises EPG (Electronic Program Guide) information.

71. (Previously Presented) The digital signal processing apparatus of claim 59, wherein the processing unit comprises:

- an acquisition unit, configured to acquire a user key;

- a filtering unit, configured to filter the signals received via the interface, to obtain authorization information for a user;

- a decryption unit, configured to perform decryption on the authorization information according to the user key, to obtain a de-scrambling key; and

- a de-scrambling unit, configured to de-scramble the signals received via the interface according to the de-scrambling key.

72. (Previously Presented) The digital signal processing apparatus of claim 71, wherein the de-scrambling unit sends the de-scrambled signals via the interface.

73. (Previously Presented) The digital signal processing apparatus of claim 71, further comprising:

a communication interface module, configured to receive and transmit data which accords with a particular transport protocol.

74. (Previously Presented) The digital signal processing apparatus of claim 73, wherein the particular transport protocol comprises at least one of Ethernet transport protocol, Cable Modem transport protocol, SmartCard transport protocol and wireless protocol.

75. (Previously Presented) The digital signal processing apparatus of claim 73, wherein the de-scrambled signals are transmitted via the communication interface module.

76. (Previously Presented) The digital signal processing apparatus of claim 72, further comprising:

a control unit, configured to generate control information according to a user requirement;

wherein the control information may be transmitted via the interface.

77. (Previously Presented) The digital signal processing apparatus of claim 72, further comprising:

a RF (Radio Frequency) processing unit, configured to demodulate the RF signals received by the digital signal processing apparatus, to transmit the demodulated signals via the interface.

78. (Previously Presented) The digital signal processing apparatus of claim 77, further comprising:

a control unit, configured to generate control information according to a user requirement;

wherein the RF processing unit is further configured to transmit the control information.

79. (Withdrawn) The digital signal processing apparatus of claim 59, further comprising:

a storage unit, configured to store signals received via at least one of the interface and the communication interface module.

80. (Withdrawn) The digital signal processing apparatus of claim 59, further comprising:

an EPG (Electronic Program Guide) information extracting and parsing unit, configured to extract and parse EPG information from the signals received via the interface;
wherein the interface transmits the parsed EPG information.

81. (Withdrawn) The digital signal processing apparatus of claim 59, further comprising:

a software downloading unit, configured to extract software data from the signals received via the interface.

82. (Withdrawn) The digital signal processing apparatus of claim 81, further comprising:

a software updating unit, configured to update the current software by using the extracted software data.

83. (Withdrawn) The digital signal processing apparatus of claim 81, wherein the software data is transmitted via the interface.

84. (Withdrawn) The digital signal processing apparatus of claim 62, further comprising:

a tuner control unit, configured to control the RF processing unit according to the control information received via the interface, to receive signals on a corresponding channel.

85. (Withdrawn) The digital signal processing apparatus of claim 78, further comprising:

a tuner control unit, configured to control the RF processing unit according to the control information received via the interface, to receive signals on a corresponding channel.

86. (Currently Amended) A data transfer method between a digital signal processing host device and an external service module, comprising steps of:

receiving data which accords with a USB (Universal Serial Bus) specification from the digital signal processing host device;

detecting the received USB packets ~~[[data]]~~ to determine whether the received USB packets carries ~~to convert the received data into~~ processing data which accords with a particular specification and is available for the external service module; ~~[[and]]~~

identifying an interface protocol of the external service module;

converting the received USB packets to obtain data ~~into~~ the processing data which accords with the particular specification after determining that the received USB packets carries ~~data should be converted into~~ the processing data which accords with the particular specification;

converting transmission data which accords with the particular specification into data which accords with the USB specification, based on the identified interface protocol of the external service module; and

transmitting to the external service module the converted transmission data which accords with the USB specification.

87. (Canceled)

88. (Previously Presented) The data transfer method of claim 87, wherein the converting the transmission data step further comprises the step of:

packaging the transmission data into the converted data which accords with the USB specification.

89. (Previously Presented) The data transfer method of claim 86 wherein the particular specification is a MPEG specification.